USDA
United States Department of Agriculture

Natural Resources Conservation Service
CONSERVATION Showcase

Yields, Environment Benefit from Spring Split N Applications

by Jason Johnson, Public Affairs Specialist

A 39-year farming veteran split from his past farming practices to use less fertilizer and improve crop health and yield performance. By replacing anhydrous ammonia with split spring applications of liquid nitrogen, he is also supporting Iowa's Nutrient Reduction Strategy by reducing the risk of leaching and runoff.

RJ Carson farms with his son Greg. Together, they farm several thousand acres in Linn, Delaware and Cedar Counties. Their operation includes a mixture of continuous no-till corn-soybean rotation and corn-on-corn using a vertical tillage tool. They also raise about 100 beef cows, sold as feeder calves.

Four years ago RJ noticed their corn-on-corn crop struggling to produce late in the growing season. "We were having a difficult time managing the amount of residue with corn-on-corn," he said. "We noticed the corn turn light green and yellow late in the growing season. It needed a pop!"

RJ Carson of Marion

"For the type of corn genetics we're planting now, we know that it needs 80 units of nitrogen available to it from pollination through kernel fill," Carson said. "Ten years ago that number was much less."

After researching new technology, attending meetings, and working with agronomist Dennis Holland from DuPont Pioneer®, they decided to eliminate fall anhydrous ammonia and began applying liquid nitrogen in the spring when the plant needs it most.

The Carsons began applying liquid nitrogen in the spring through two, three and four applications, depending on the field, previous crop, corn variety, and yield potential. "We account for fall-applied potash and phosphate (NPK), which is all variable rated and grid sampled," said RJ.

Fertilizer Plan

- Fall – potash and phosphate/NPK (15-20 units of N)
- Early Spring Pre-Plant – UAN 32% liquid nitrogen with 10-34-0 liquid ammonia phosphate (75 units of N)
- June – Sidedress liquid nitrogen with the first pass of corn herbicide (30 units of N)
- July – Variable rate liquid nitrogen with a 24-row "Y" drop sprayer using a Hagie high clearance tractor and an Ag Leader OptRx® crop sensor (50-60 units of N)

Carson says the ability to apply nitrogen as late as mid-July is a key component in his spring fertilizer plan.

CONSERVATION Showcase

The Carsons are using a Hagie Tall Corn applicator to protect the crop while applying nitrogen in tall corn. “We could not execute our plan without the high clearance applicator,” RJ said. “This technology changed the way we apply nutrients.”

They began applying their final nitrogen application on July 7 this year to fields that were beginning to turn light green, which indicates a nitrogen deficiency. “In less than 48 hours all new growth was coming out – so deep green it was phenomenal,” he said.

Greg Carson applies liquid nitrogen in a seed corn field in Cedar County on July 17, 2014. The N application is variable rated using a “Y” drop sprayer and an Ag Leader OptRx® crop sensor.

The Carsons are not limiting their new fertilizer plan to corn-on-corn. They are also using split N applications in most of his corn-soybean rotation fields. The results have been eye-opening. “Our yields have been phenomenal,” RJ said. “We did some field to field comparisons last year, and found 25 to 55 bushel per acre increases with our new split application system.”

New System Benefits Environment

It may be difficult to assess the exact environmental benefits their new fertilizer plan provides, but RJ knows they are applying less nitrogen than before. He says they were applying about 250 units of anhydrous ammonia in the fall with corn-on-corn, and now their applications are more field precise, ranging from 170 to 200 units.

“I really feel we are better land stewards now,” he said. “We are not only applying fewer nutrients, we are applying them when the plant needs it, so it is taking it right up, dramatically decreasing the risk of leaching or runoff.”

Time Commitment

One downfall of the new system is an increase of time in the field, although some of that was spent custom applying. During Greg’s July application this year, he worked 7 a.m. to midnight for a few weeks using the high clearance tractor. “Between our farm and custom applying, he probably covered 10,000 acres in July,” RJ said.

“It’s a lot of work when many farmers are taking a vacation,” he said. “We stay very busy from March 1 with calving through harvest.”

Visit your local USDA-Natural Resources Conservation Service office to learn more about a conservation plan to help build your farm’s productivity and improve your net return.